

OM-224 175D
2006−12

Processes



MIG (GMAW) Welding
Flux Cored (FCAW) Welding

Description

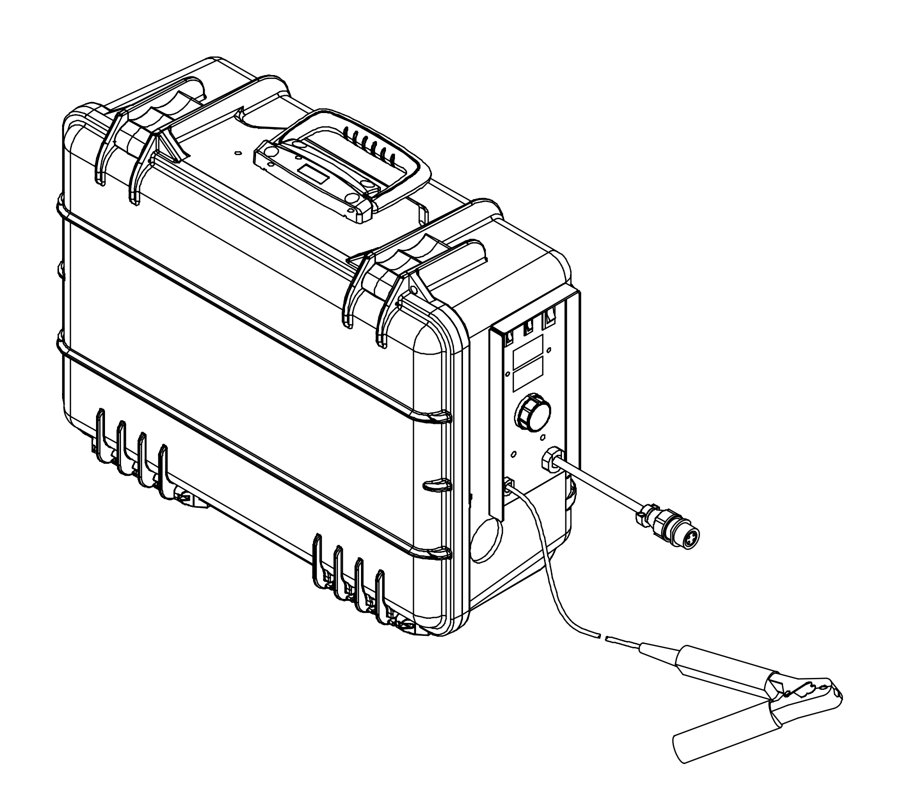






Wire Feeder

SuitCase™ 12VS RED-D-ARC



OWNER'S MANUAL

File: MIG (GMAW)



www.red-d-arc.com

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SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

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▲ **Warning: Protect yourself and others from injury — read and follow these precautions.**

1-1. Symbol Usage



Means Warning! Watch Out! There are possible hazards with this procedure! The possible hazards are shown in the adjoining symbols.

▲ **Marks a special safety message.**

☞ *Means "Note"; not safety related.*

This group of symbols means Warning! Watch Out! possible ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.

1-2. Arc Welding Hazards

▲ **The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1-5. Read and follow all Safety Standards.**

▲ **Only qualified persons should install, operate, maintain, and repair this unit.**

▲ **During operation, keep everybody, especially children, away.**



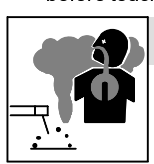
ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control if present on unit.
- Additional safety precautions are required when any of the following electrically hazardous conditions are present: in damp locations or while wearing wet clothing; on metal structures such as floors, gratings, or scaffolds; when in cramped positions such as sitting, kneeling, or lying; or when there is a high risk of unavoidable or accidental contact with the workpiece or ground. For these conditions, use the following equipment in order presented: 1) a semiautomatic DC constant voltage (wire) welder, 2) a DC manual (stick) welder, or 3) an AC welder with reduced open-circuit voltage. In most situations, use of a DC, constant voltage wire welder is recommended. And, do not work alone!
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground – check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first – double-check connections.
- Frequently inspect input power cord for damage or bare wiring – replace cord immediately if damaged – bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or poorly spliced cables.
- Do not drape cables over your body.
- If earth grounding of the workpiece is required, ground it directly with a separate cable.
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Do not touch electrode holders connected to two welding machines at the same time since double open-circuit voltage will be present.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- Do not connect more than one electrode or work cable to any single weld output terminal.

SIGNIFICANT DC VOLTAGE exists in inverter-type welding power sources after removal of input power.

- Turn Off inverter, disconnect input power, and discharge input capacitors according to instructions in Maintenance Section before touching any parts.



FUMES AND GASES can be hazardous.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

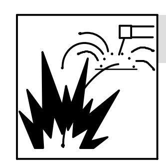
- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use local forced ventilation at the arc to remove welding fumes and gases.
- If ventilation is poor, wear an approved air-supplied respirator.
- Read and understand the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watchperson nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.



ARC RAYS can burn eyes and skin.

Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

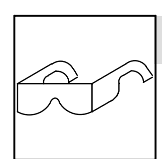
- Wear an approved welding helmet fitted with a proper shade of filter lenses to protect your face and eyes when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash, glare and sparks; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (leather, heavy cotton, or wool) and foot protection.



WELDING can cause fire or explosion.

Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Do not weld where flying sparks can strike flammable material.
- Protect yourself and others from flying sparks and hot metal.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWS F4.1 (see Safety Standards).
- Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock, sparks, and fire hazards.
- Do not use welder to thaw frozen pipes.
- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.
- Follow requirements in OSHA 1910.252 (a) (2) (iv) and NFPA 51B for hot work and have a fire watcher and extinguisher nearby.



FLYING METAL can injure eyes.

- Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
- Wear approved safety glasses with side shields even under your welding helmet.



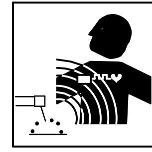
BUILDUP OF GAS can injure or kill.

- Shut off shielding gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.



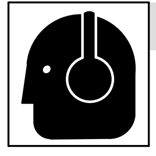
HOT PARTS can cause severe burns.

- Do not touch hot parts bare handed.
- Allow cooling period before working on gun or torch.
- To handle hot parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.



MAGNETIC FIELDS can affect pacemakers.

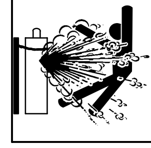
- Pacemaker wearers keep away.
- Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.



NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.

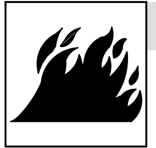


CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

- Protect compressed gas cylinders from excessive heat, mechanical shocks, physical damage, slag, open flames, sparks, and arcs.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
- Keep cylinders away from any welding or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow a welding electrode to touch any cylinder.
- Never weld on a pressurized cylinder − explosion will result.
- Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
- Turn face away from valve outlet when opening cylinder valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Use the right equipment, correct procedures, and sufficient number of persons to lift and move cylinders.
- Read and follow instructions on compressed gas cylinders, associated equipment, and Compressed Gas Association (CGA) publication P-1 listed in Safety Standards.

1-3. Additional Symbols For Installation, Operation, And Maintenance



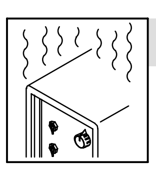
FIRE OR EXPLOSION hazard.

- Do not install or place unit on, over, or near combustible surfaces.
- Do not install unit near flammables.
- Do not overload building wiring – be sure power supply system is properly sized, rated, and protected to handle this unit.



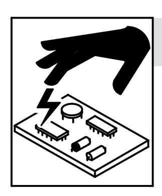
FALLING UNIT can cause injury.

- Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
- Use equipment of adequate capacity to lift and support unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.



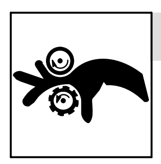
OVERUSE can cause OVERHEATING

- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.



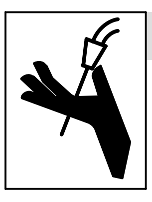
STATIC (ESD) can damage PC boards.

- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.



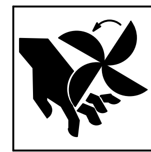
MOVING PARTS can cause injury.

- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.



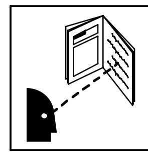
WELDING WIRE can cause injury.

- Do not press gun trigger until instructed to do so.
- Do not point gun toward any part of the body, other people, or any metal when threading welding wire.



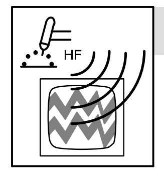
MOVING PARTS can cause injury.

- Keep away from moving parts such as fans.
- Keep all doors, panels, covers, and guards closed and securely in place.
- Have only qualified persons remove doors, panels, covers, or guards for maintenance as necessary.
- Reinstall doors, panels, covers, or guards when maintenance is finished and before reconnecting input power.



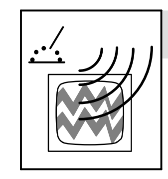
READ INSTRUCTIONS.

- Read Owner's Manual before using or servicing unit.
- Use only genuine Miller/Hobart replacement parts.



H.F. RADIATION can cause interference.

- High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.
- Have only qualified persons familiar with electronic equipment perform this installation.
- The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
- If notified by the FCC about interference, stop using the equipment at once.
- Have the installation regularly checked and maintained.
- Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.



ARC WELDING can cause interference.

- Electromagnetic energy can interfere with sensitive electronic equipment such as computers and computer-driven equipment such as robots.
- Be sure all equipment in the welding area is electromagnetically compatible.
- To reduce possible interference, keep weld cables as short as possible, close together, and down low, such as on the floor.
- Locate welding operation 100 meters from any sensitive electronic equipment.
- Be sure this welding machine is installed and grounded according to this manual.
- If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.

1-4. California Proposition 65 Warnings

▲ **Welding or cutting equipment produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq.)**

▲ **Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Wash hands after handling.**

For Gasoline Engines:

▲ **Engine exhaust contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.**

For Diesel Engines:

▲ **Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.**

1-5. Principal Safety Standards

Safety in Welding, Cutting, and Allied Processes, ANSI Standard Z49.1, from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping, American Welding Society Standard AWS F4.1 from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, P.O. Box 9101, 1 Battery March Park, Quincy, MA 02269−9101 (phone: 617−770−3000, website: www.nfpa.org).

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1735 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202−4102 (phone: 703−412−0900, website: www.cganet.com).

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3 (phone: 800−463−6727 or in Toronto 416−747−4044, website: www.csa−international.org).

Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 11 West 42nd Street, New York, NY 10036−8002 (phone: 212−642−4900, website: www.ansi.org).

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B, from National Fire Protection Association, P.O. Box 9101, 1 Battery March Park, Quincy, MA 02269−9101 (phone: 617−770−3000, website: www.nfpa.org).

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910, Subpart Q, and Part 1926, Subpart J, from U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250 (there are 10 Regional Offices−−phone for Region 5, Chicago, is 312−353−2220, website: www.osha.gov).

1-6. EMF Information

Considerations About Welding And The Effects Of Low Frequency Electric And Magnetic Fields

Welding current, as it flows through welding cables, will cause electromagnetic fields. There has been and still is some concern about such fields. However, after examining more than 500 studies spanning 17 years of research, a special blue ribbon committee of the National Research Council concluded that: "The body of evidence, in the committee's judgment, has not demonstrated that exposure to power-frequency electric and magnetic fields is a human-health hazard." However, studies are still going forth and evidence continues to be examined. Until the final conclusions of the research are reached, you may wish to minimize your exposure to electromagnetic fields when welding or cutting.

To reduce magnetic fields in the workplace, use the following procedures:

1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep welding power source and cables as far away from operator as practical.
5. Connect work clamp to workpiece as close to the weld as possible.

About Pacemakers:

Pacemaker wearers consult your doctor before welding or going near welding operations. If cleared by your doctor, then following the above procedures is recommended.

SECTION 2 – CONSIGNES DE SÉCURITÉ – LIRE AVANT UTILISATION

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▲ **Avertissement : se protéger et protéger les autres contre le risque de blessure — lire et respecter ces consignes.**

2-1. Symboles utilisés



Symbole graphique d'avertissement ! Attention ! Cette procédure comporte des risques possibles ! Les dangers éventuels sont représentés par les symboles graphiques joints.

▲ **Indique un message de sécurité particulier**

☞ *Signifie NOTE ; n'est pas relatif à la sécurité.*

Ce groupe de symboles signifie Avertissement ! Attention ! Risques d'ÉLECTROCUTION, ORGANES MOBILES et PARTIES CHAUDES. Consulter les symboles et les instructions afférentes ci-dessous concernant les mesures à prendre pour supprimer les dangers.

2-2. Dangers relatifs au soudage à l'arc

▲ **Les symboles représentés ci-dessous sont utilisés dans ce manuel pour attirer l'attention et identifier les dangers possibles. En présence de l'un de ces symboles, prendre garde et suivre les instructions afférentes pour éviter tout risque. Les instructions en matière de sécurité indiquées ci-dessous ne constituent qu'un sommaire des instructions de sécurité plus complètes fournies dans les normes de sécurité énumérées dans la Section 2-5. Lire et observer toutes les normes de sécurité.**

▲ **Seul un personnel qualifié est autorisé à installer, faire fonctionner, entretenir et réparer cet appareil.**

▲ **Pendant le fonctionnement, maintenir à distance toutes les personnes, notamment les enfants de l'appareil.**



UNE DÉCHARGE ÉLECTRIQUE peut entraîner la mort.

Le contact d'organes électriques sous tension peut provoquer des accidents mortels ou des brûlures graves. Le circuit de l'électrode et de la pièce est sous tension lorsque le courant est délivré à la sortie. Le circuit d'alimentation et les circuits internes de la machine sont également sous tension lorsque l'alimentation est sur Marche. Dans le mode de soudage avec du fil, le fil, le dérouleur, le bloc de commande du rouleau et toutes les parties métalliques en contact avec le fil sont sous tension électrique. Un équipement installé ou mis à la terre de manière incorrecte ou impropre constitue un danger.

- Ne pas toucher aux pièces électriques sous tension.
- Porter des gants isolants et des vêtements de protection secs et sans trous.
- S'isoler de la pièce à couper et du sol en utilisant des housses ou des tapis assez grands afin d'éviter tout contact physique avec la pièce à couper ou le sol.
- Ne pas se servir de source électrique à courant électrique dans les zones humides, dans les endroits confinés ou là où on risque de tomber.
- Se servir d'une source électrique à courant électrique UNIQUEMENT si le procédé de soudage le demande.
- Si l'utilisation d'une source électrique à courant électrique s'avère nécessaire, se servir de la fonction de télécommande si l'appareil en est équipé.
- D'autres consignes de sécurité sont nécessaires dans les conditions suivantes : risques électriques dans un environnement humide ou si l'on porte des vêtements mouillés ; sur des structures métalliques telles que sols, grilles ou échafaudages ; en position coincée comme assise, à genoux ou couchée ; ou s'il y a un risque élevé de contact inévitable ou accidentel avec la pièce à souder ou le sol. Dans ces conditions, utiliser les équipements suivants, dans l'ordre indiqué : 1) un poste à souder DC à tension constante (à fil), 2) un poste à souder DC manuel (électrode) ou 3) un poste à souder AC à tension à vide réduite. Dans la plupart des situations, l'utilisation d'un poste à souder DC à fil à tension constante est recommandée. En outre, ne pas travailler seul !
- Couper l'alimentation ou arrêter le moteur avant de procéder à l'installation, à la réparation ou à l'entretien de l'appareil. Déverrouiller l'alimentation selon la norme OSHA 29 CFR 1910.147 (voir normes de sécurité).
- Installer le poste correctement et le mettre à la terre convenablement selon les consignes du manuel de l'opérateur et les normes nationales, provinciales et locales.
- Toujours vérifier la terre du cordon d'alimentation. Vérifier et s'assurer que le fil de terre du cordon d'alimentation est bien raccordé à la borne de terre du sectionneur ou que la fiche du cordon est raccordée à une prise correctement mise à la terre.
- En effectuant les raccordements d'entrée, fixer d'abord le conducteur de mise à la terre approprié et contre-vérifier les connexions.
- Vérifier fréquemment le cordon d'alimentation afin de s'assurer qu'il n'est pas altéré ou à nu, le remplacer immédiatement s'il l'est. Un fil à nu peut entraîner la mort.
- L'équipement doit être hors tension lorsqu'il n'est pas utilisé.
- Ne pas utiliser des câbles usés, endommagés, de grosseur insuffisante ou mal épissés.
- Ne pas enrouler les câbles autour du corps.
- Si la pièce soudée doit être mise à la terre, le faire directement avec un câble distinct.
- Ne pas toucher l'électrode quand on est en contact avec la pièce, la terre ou une électrode provenant d'une autre machine.
- Ne pas toucher des porte électrodes connectés à deux machines en même temps à cause de la présence d'une tension à vide doublée.
- N'utiliser qu'un matériel en bon état. Réparer ou remplacer sur-le-champ les pièces endommagées. Entretenir l'appareil conformément à ce manuel.
- Porter un harnais de sécurité si l'on doit travailler au-dessus du sol.
- S'assurer que tous les panneaux et couvercles sont correctement en place.
- Fixer le câble de retour de façon à obtenir un bon contact métal-métal avec la pièce à souder ou la table de travail, le plus près possible de la soudure.
- Isoler la pince de masse quand pas mis à la pièce pour éviter le contact avec tout objet métallique.
- Ne pas raccorder plus d'une électrode ou plus d'un câble de masse à une même borne de sortie de soudage.

Il reste une TENSION DC NON NÉGLIGEABLE dans les sources de soudage onduleur quand on a coupé l'alimentation.

- Arrêter les convertisseurs, débrancher le courant électrique et décharger les condensateurs d'alimentation selon les instructions indiquées dans la partie Entretien avant de toucher les pièces.



LES FUMÉES ET LES GAZ peuvent être dangereux.

Le soudage génère des fumées et des gaz. Leur inhalation peut être dangereuse pour la santé.

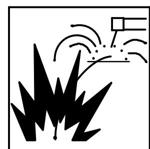
- Ne pas mettre sa tête au-dessus des vapeurs. Ne pas respirer ces vapeurs.
- À l'intérieur, ventiler la zone et/ou utiliser une ventilation forcée au niveau de l'arc pour l'évacuation des fumées et des gaz de soudage.
- Si la ventilation est médiocre, porter un respirateur anti-vapeurs approuvé.
- Lire et comprendre les spécifications de sécurité des matériaux (MSDS) et les instructions du fabricant concernant les métaux, les consommables, les revêtements, les nettoyants et les dégraisseurs.
- Travailler dans un espace fermé seulement s'il est bien ventilé ou en portant un respirateur à alimentation d'air. Demander toujours à un surveillant dûment formé de se tenir à proximité. Des fumées et des gaz de soudage peuvent déplacer l'air et abaisser le niveau d'oxygène provoquant des blessures ou des accidents mortels. S'assurer que l'air de respiration ne présente aucun danger.
- Ne pas souder dans des endroits situés à proximité d'opérations de dégraissage, de nettoyage ou de pulvérisation. La chaleur et les rayons de l'arc peuvent réagir en présence de vapeurs et former des gaz hautement toxiques et irritants.
- Ne pas souder des métaux munis d'un revêtement, tels que l'acier galvanisé, plaqué en plomb ou au cadmium à moins que le revêtement n'ait été enlevé dans la zone de soudure, que l'endroit soit bien ventilé et en portant un respirateur à alimentation d'air. Les revêtements et tous les métaux renfermant ces éléments peuvent dégager des fumées toxiques en cas de soudage.



LES RAYONS D'ARC peuvent entraîner des brûlures aux yeux et à la peau.

Le rayonnement de l'arc du procédé de soudage génère des rayons visibles et invisibles intenses (ultraviolets et infrarouges) susceptibles de provoquer des brûlures dans les yeux et sur la peau. Des étincelles sont projetées pendant le soudage.

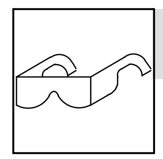
- Porter un casque de soudage approuvé muni de verres filtrants approprié pour protéger visage et yeux pendant le soudage (voir ANSI Z49.1 et Z87.1 énuméré dans les normes de sécurité).
- Porter des lunettes de sécurité avec écrans latéraux même sous votre casque.
- Avoir recours à des écrans protecteurs ou à des rideaux pour protéger les autres contre les rayonnements les éblouissements et les étincelles ; prévenir toute personne sur les lieux de ne pas regarder l'arc.
- Porter des vêtements confectionnés avec des matières résistantes et ignifuges (cuir, coton lourd ou laine) et des bottes de protection.



LE SOUDAGE peut provoquer un incendie ou une explosion.

Le soudage effectué sur des conteneurs fermés tels que des réservoirs, tambours ou des conduites peut provoquer leur éclatement. Des étincelles peuvent être projetées de l'arc de soudure. La projection d'étincelles, des pièces chaudes et des équipements chauds peuvent provoquer des incendies et des brûlures. Le contact accidentel de l'électrode avec des objets métalliques peut provoquer des étincelles, une explosion, une surchauffe ou un incendie. Avant de commencer le soudage, vérifier et s'assurer que l'endroit ne présente pas de danger.

- Déplacer toutes les substances inflammables à une distance de 10,7 m de l'arc de soudage. En cas d'impossibilité, les recouvrir soigneusement avec des protections homologuées.
- Ne pas souder dans un endroit où des étincelles peuvent tomber sur des substances inflammables.
- Se protéger, ainsi que toute autre personne travaillant sur les lieux, contre les étincelles et le métal chaud.
- Des étincelles et des matériaux chauds du soudage peuvent facilement passer dans d'autres zones en traversant de petites fissures et des ouvertures.
- Afin d'éliminer tout risque de feu, être vigilant et garder toujours un extincteur à la portée de main.
- Le soudage effectué sur un plafond, plancher, paroi ou séparation peut déclencher un incendie de l'autre côté.
- Ne pas effectuer le soudage sur des conteneurs fermés tels que des réservoirs, tambours, ou conduites, à moins qu'ils n'aient été préparés correctement conformément à AWS F4.1 (voir les normes de sécurité).
- Brancher le câble de masse sur la pièce le plus près possible de la zone de soudage pour éviter le transport du courant sur une longue distance par des chemins inconnus éventuels en provoquant des risques d'électrocution, d'étincelles et d'incendie.
- Ne pas utiliser le poste de soudage pour dégeler des conduites gelées.
- En cas de non-utilisation, enlever la baguette d'électrode du porte-électrode ou couper le fil à la pointe de contact.
- Porter des vêtements de protection exempts d'huile tels que des gants en cuir, une veste résistante, des pantalons sans revers, des bottes et un casque.
- Avant de souder, retirer toute substance combustible de ses poches telles qu'un allumeur au butane ou des allumettes.
- Suivre les consignes de OSHA 1910.252 (a) (2) (iv) et de NFPA 51B pour travaux de soudage et prévoir un détecteur d'incendie et un extincteur à proximité.



DES PARTICULES VOLANTES peuvent blesser les yeux.

- Le soudage, l'écaillement, le passage de la pièce à la brosse en fil de fer, et le meulage génèrent des étincelles et des particules métalliques volantes. Pendant la période de refroidissement des soudures, elles risquent de projeter du laitier.
- Porter des lunettes de sécurité avec écrans latéraux ou un écran facial.



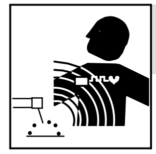
LES ACCUMULATIONS DE GAZ risquent de provoquer des blessures ou même la mort.

- Fermer l'alimentation du gaz protecteur en cas de non-utilisation.
- Veiller toujours à bien aérer les espaces confinés ou se servir d'un respirateur d'adduction d'air homologué.



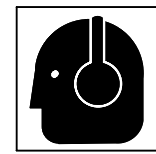
DES PIÈCES CHAUDES peuvent provoquer des brûlures graves.

- Ne pas toucher des parties chaudes à mains nues.
- Prévoir une période de refroidissement avant d'utiliser le pistolet ou la torche.
- Ne pas toucher aux pièces chaudes, utiliser les outils recommandés et porter des gants de soudage et des vêtements épais pour éviter les brûlures.



LES CHAMPS MAGNÉTIQUES peuvent affecter les stimulateurs cardiaques.

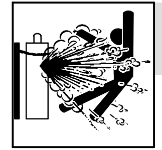
- Porteurs de stimulateur cardiaque, rester à distance.
- Les porteurs d'un stimulateur cardiaque doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de gougeage ou de soudage par points.



LE BRUIT peut endommager l'ouïe.

Le bruit des processus et des équipements peut affecter l'ouïe.

- Porter des protections approuvées pour les oreilles si le niveau sonore est trop élevé.



LES BOUTEILLES peuvent exploser si elles sont endommagées.

Des bouteilles de gaz protecteur contiennent du gaz sous haute pression. Si une bouteille est endommagée, elle peut exploser. Du fait que les bouteilles de gaz font normalement partie du procédé de soudage, les manipuler avec précaution.

- Protéger les bouteilles de gaz comprimé d'une chaleur excessive, des chocs mécaniques, des dommages physiques, du laitier, des flammes ouvertes, des étincelles et des arcs.
- Placer les bouteilles debout en les fixant dans un support stationnaire ou dans un porte-bouteilles pour les empêcher de tomber ou de se renverser.
- Tenir les bouteilles éloignées des circuits de soudage ou autres circuits électriques.
- Ne jamais placer une torche de soudage sur une bouteille à gaz.
- Une électrode de soudage ne doit jamais entrer en contact avec une bouteille.
- Ne jamais souder une bouteille pressurisée – risque d'explosion.
- Utiliser seulement des bouteilles de gaz protecteur, régulateurs, tuyaux et raccords convenables pour cette application spécifique ; les maintenir ainsi que les éléments associés en bon état.
- Détourner votre visage du détendeur-régulateur lorsque vous ouvrez la soupape de la bouteille.
- Le couvercle du détendeur doit toujours être en place, sauf lorsque la bouteille est utilisée ou qu'elle est reliée pour usage ultérieur.
- Utiliser les équipements corrects, les bonnes procédures et suffisamment de personnes pour soulever et déplacer les bouteilles.
- Lire et suivre les instructions sur les bouteilles de gaz comprimé, l'équipement connexe et le dépliant P-1 de la CGA (Compressed Gas Association) mentionné dans les principales normes de sécurité.

2-3. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance



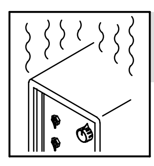
Risque D'INCENDIE OU D'EXPLOSION.

- Ne pas placer l'appareil sur, au-dessus ou à proximité de surfaces inflammables.
- Ne pas installer l'appareil à proximité de produits inflammables.
- Ne pas surcharger l'installation électrique – s'assurer que l'alimentation est correctement dimensionnée et protégée avant de mettre l'appareil en service.



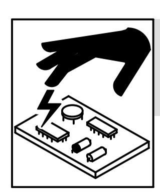
LA CHUTE DE L'APPAREIL peut blesser.

- Utiliser l'anneau de levage uniquement pour soulever l'appareil, NON PAS les chariots, les bouteilles de gaz ou tout autre accessoire.
- Utiliser un équipement de levage de capacité suffisante pour lever l'appareil.
- En utilisant des fourches de levage pour déplacer l'unité, s'assurer que les fourches sont suffisamment longues pour dépasser du côté opposé de l'appareil.



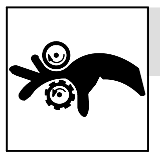
L'EMPLOI EXCESSIF peut SURCHAUFFER L'ÉQUIPEMENT.

- Prévoir une période de refroidissement ; respecter le cycle opératoire nominal.
- Réduire le courant ou le facteur de marche avant de poursuivre le soudage.
- Ne pas obstruer les passages d'air du poste.



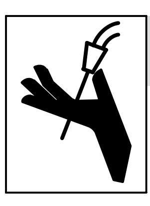
LES CHARGES ÉLECTROSTATIQUES peuvent endommager les circuits imprimés.

- Établir la connexion avec la barrette de terre avant de manipuler des cartes ou des pièces.
- Utiliser des pochettes et des boîtes antistatiques pour stocker, déplacer ou expédier des cartes PC.



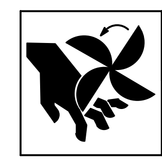
DES ORGANES MOBILES peuvent provoquer des blessures.

- Ne pas s'approcher des organes mobiles.
- Ne pas s'approcher des points de coincement tels que des rouleaux de commande.



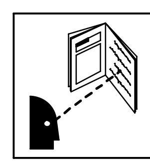
LES FILS DE SOUDAGE peuvent provoquer des blessures.

- Ne pas appuyer sur la gâchette avant d'en avoir reçu l'instruction.
- Ne pas diriger le pistolet vers soi, d'autres personnes ou toute pièce mécanique en engageant le fil de soudage.



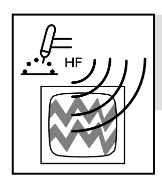
DES ORGANES MOBILES peuvent provoquer des blessures.

- S'abstenir de toucher des organes mobiles tels que des ventilateurs.
- Maintenir fermés et verrouillés les portes, panneaux, recouvrements et dispositifs de protection.
- Seules des personnes qualifiées sont autorisées à enlever les portes, panneaux, recouvrements ou dispositifs de protection pour l'entretien.
- Remettre les portes, panneaux, recouvrements ou dispositifs de protection quand l'entretien est terminé et avant de rebrancher l'alimentation électrique.



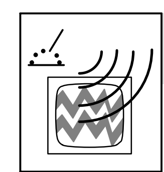
LIRE LES INSTRUCTIONS.

- Lire le manuel d'utilisation avant d'utiliser ou d'intervenir sur l'appareil.
- Utiliser uniquement des pièces de rechange Miller/Hobart.



LE RAYONNEMENT HAUTE FRÉQUENCE (HF) risque de provoquer des interférences.

- Le rayonnement haute fréquence (HF) peut provoquer des interférences avec les équipements de radio-navigation et de communication, les services de sécurité et les ordinateurs.
- Demander seulement à des personnes qualifiées familiarisées avec des équipements électroniques de faire fonctionner l'installation.
- L'utilisateur est tenu de faire corriger rapidement par un électricien qualifié les interférences résultant de l'installation.
- Si le FCC signale des interférences, arrêter immédiatement l'appareil.
- Effectuer régulièrement le contrôle et l'entretien de l'installation.
- Maintenir soigneusement fermés les portes et les panneaux des sources de haute fréquence, maintenir les éclateurs à une distance correcte et utiliser une terre et un blindage pour réduire les interférences éventuelles.



LE SOUDAGE À L'ARC risque de provoquer des interférences.

- L'énergie électromagnétique peut gêner le fonctionnement d'appareils électroniques comme des ordinateurs et des robots.
- Veiller à ce que tout l'équipement de la zone de soudage soit compatible électromagnétiquement.
- Pour réduire la possibilité d'interférence, maintenir les câbles de soudage aussi courts que possible, les grouper, et les poser aussi bas que possible (ex. par terre).
- Veiller à souder à une distance de 100 mètres de tout équipement électronique sensible.
- Veiller à ce que ce poste de soudage soit posé et mis à la terre conformément à ce mode d'emploi.
- En cas d'interférences après avoir pris les mesures précédentes, il incombe à l'utilisateur de prendre des mesures supplémentaires telles que le déplacement du poste, l'utilisation de câbles blindés, l'utilisation de filtres de ligne ou la pose de protecteurs dans la zone de travail.

2-4. Proposition californienne 65 Avertissements

▲ **Les équipements de soudage et de coupage produisent des fumées et des gaz qui contiennent des produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des malformations congénitales et, dans certains cas, des cancers. (Code de santé et de sécurité de Californie, chapitre 25249.5 et suivants)**

▲ **Les batteries, les bornes et autres accessoires contiennent du plomb et des composés à base de plomb, produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des cancers et des malformations congénitales ou autres problèmes de procréation. Se laver les mains après manipulation.**

Pour les moteurs à essence :

▲ **Les gaz d'échappement des moteurs contiennent des produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des cancers et des malformations congénitales ou autres problèmes de procréation.**

Pour les moteurs diesel :

▲ **Les gaz d'échappement des moteurs diesel et certains de leurs composants sont reconnus par l'État de Californie comme provoquant des cancers et des malformations congénitales ou autres problèmes de procréation.**

2-5. Principales normes de sécurité

Safety in Welding, Cutting, and Allied Processes, ANSI Standard Z49.1, de Global Engineering Documents (téléphone : 1-877-413-5184, site Internet : www.global.ihs.com).

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping, American Welding Society Standard AWS F4.1 de Global Engineering Documents (téléphone : 1-877-413-5184, site Internet : www.global.ihs.com).

National Electrical Code, NFPA Standard 70, de National Fire Protection Association, P.O. Box 9101, 1 Battery March Park, Quincy, MA 02269-9101 (téléphone : 617-770-3000, site Internet : www.nfpa.org).

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, de Compressed Gas Association, 1735 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4102 (téléphone : 703-412-0900, site Internet : www.cganet.com).

Code for Safety in Welding and Cutting, CSA Standard W117.2, de Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3 (téléphone : 800-463-6727 ou à Toronto 416-747-4044, site Internet : www.csa-international.org).

Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, de American National Standards Institute, 11 West 42nd Street, New York, NY 10036-8002 (téléphone : 212-642-4900, site Internet : www.ansi.org).

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B, de National Fire Protection Association, P.O. Box 9101, 1 Battery March Park, Quincy, MA 02269-9101 (téléphone : 617-770-3000, site Internet : www.nfpa.org).

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910, Subpart Q, and Part 1926, Subpart J, de U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250 (il y a 10 bureaux régionaux−−le téléphone de la région 5, Chicago, est 312-353-2220, site Internet : www.osha.gov).

2-6. Information EMF

Considérations sur le soudage et les effets de basse fréquence et des champs magnétiques et électriques.

Le courant de soudage, pendant son passage dans les câbles de soudage, causera des champs électromagnétiques. Il y a eu et il y a encore un certain souci à propos de tels champs. Cependant, après avoir examiné plus de 500 études qui ont été faites pendant une période de recherche de 17 ans, un comité spécial ruban bleu du National Research Council a conclu : « L'accumulation de preuves, suivant le jugement du comité, n'a pas démontré que l'exposition aux champs magnétiques et champs électriques à haute fréquence représente un risque à la santé humaine ». Toutefois, des études sont toujours en cours et les preuves continuent à être examinées. En attendant que les conclusions finales de la recherche soient établies, il vous serait souhaitable de réduire votre exposition aux champs électromagnétiques pendant le soudage ou le coupage.

Pour réduire les champs magnétiques sur le poste de travail, appliquer les procédures suivantes :

1. Maintenir les câbles ensemble en les tordant ou en les enveloppant.
2. Disposer les câbles d'un côté et à distance de l'opérateur.
3. Ne pas courber pas et ne pas entourer pas les câbles autour de votre corps.
4. Garder le poste de soudage et les câbles le plus loin possible de vous.
5. Connecter la pince sur la pièce aussi près que possible de la soudure.

En ce qui concerne les stimulateurs cardiaques

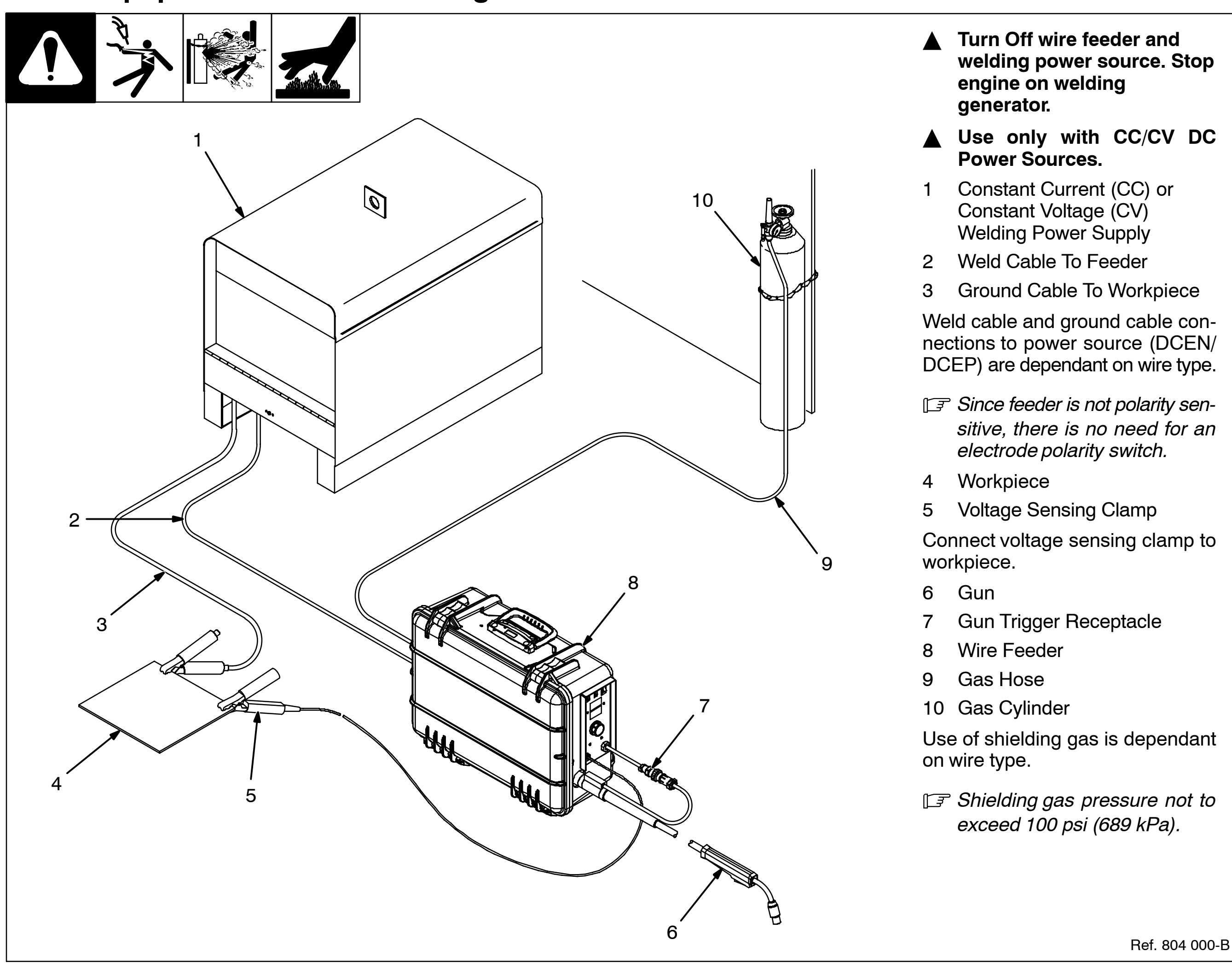
Les porteurs de stimulateur cardiaque doivent consulter leur médecin avant de souder ou d'approcher des opérations de soudage. Si le médecin approuve, il est recommandé de suivre les procédures précédentes.

SECTION 3 – INSTALLATION

3-1. Specifications

Type of Input Power	Welding Power Source Type	Wire Feed Speed Range	Wire Diameter Range	Input Welding Circuit Rating	IP Rating	Max. Wire Spool Capacity	Overall Dimensions	Weight
Open-Circuit/ Arc Voltage, 14 – 110 Volts DC	Constant Voltage (CV) Or Constant Current (CC) DC Power Source Only	50 – 780 ipm (1.3 – 19.8 mpm) Depending On Arc Voltage	.023 To 5/64 in (0.6 To 2 mm)	425 Amperes At 60% Duty Cycle	23	45 lb (20.4 kg), 12 in (304 mm)	Length: 21 in (533 mm) Width: 9 in (229 mm) Height: 15-1/2 in (394 mm)	35 lb (16 kg)

3-2. Equipment Connection Diagram



▲ **Turn Off wire feeder and welding power source. Stop engine on welding generator.**

▲ **Use only with CC/CV DC Power Sources.**

1 Constant Current (CC) or Constant Voltage (CV) Welding Power Supply

2 Weld Cable To Feeder

3 Ground Cable To Workpiece

Weld cable and ground cable connections to power source (DCEN/ DCEP) are dependant on wire type.

☞ *Since feeder is not polarity sensitive, there is no need for an electrode polarity switch.*

4 Workpiece

5 Voltage Sensing Clamp

Connect voltage sensing clamp to workpiece.

6 Gun

7 Gun Trigger Receptacle

8 Wire Feeder

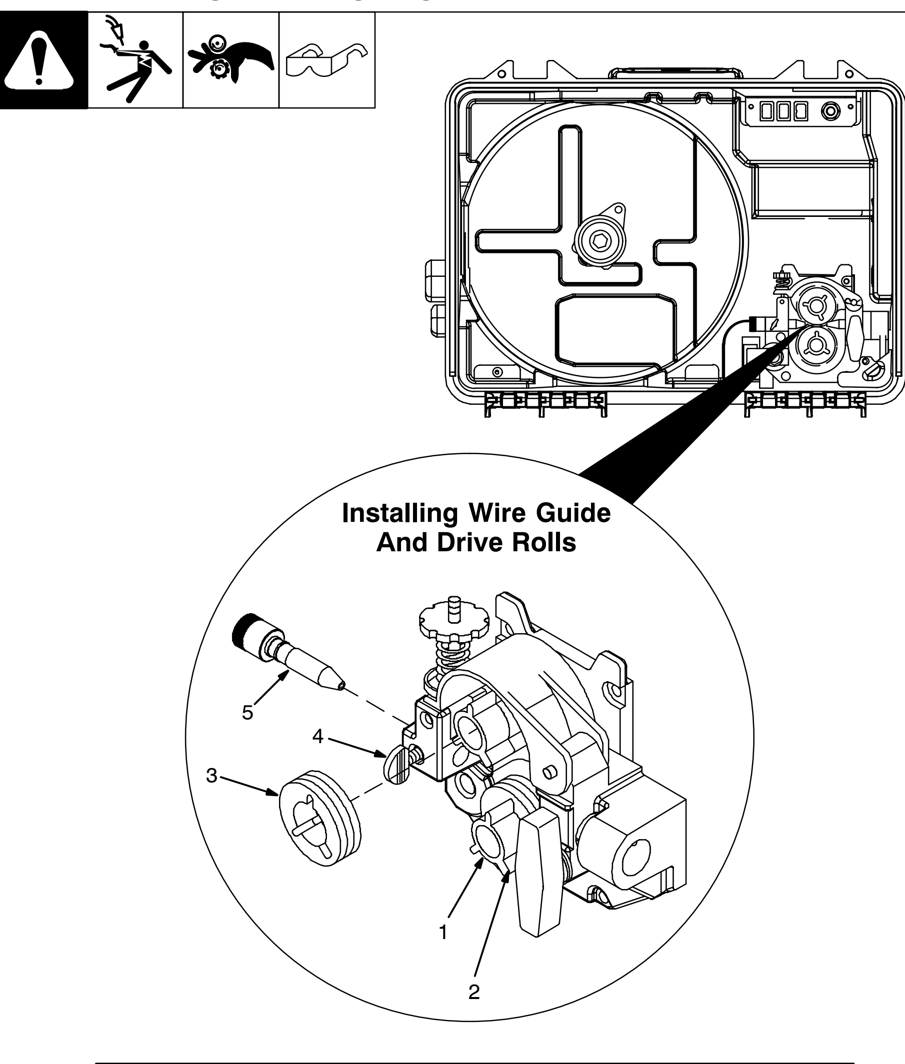
9 Gas Hose

10 Gas Cylinder

Use of shielding gas is dependant on wire type.

☞ *Shielding gas pressure not to exceed 100 psi (689 kPa).*

3-3. Installing And Aligning Wire Guide And Drive Rolls



Installing Wire Guide And Drive Rolls:

1 Drive Roll Nut

2 Drive Roll Carrier

Turn nut one click until lobes of nut line up with lobes of drive roll carrier.

3 Drive Roll

Slide drive roll onto drive roll carrier. Turn nut one click.

Repeat procedure for top drive roll.

4 Inlet Wire Guide Screw

5 Inlet Wire Guide (One Piece Anti-wear)

☞ *The factory installed inlet wire guide is good for up to 5/64 inch diameter wire.*

Loosen securing screw. Align inlet guide so inlet guide screw is centered in groove in guide, or so tip is as close to drive rolls as possible without touching. Tighten screw.

Aligning Wire Guide And Drive Rolls:

View is from top of drive rolls looking down with pressure assembly open.

6 Drive Roll Securing Nut

7 Drive Roll

8 Wire Guide

9 Welding Wire

10 Drive Gear

Turn screw in or out until drive roll groove lines up with wire guide.

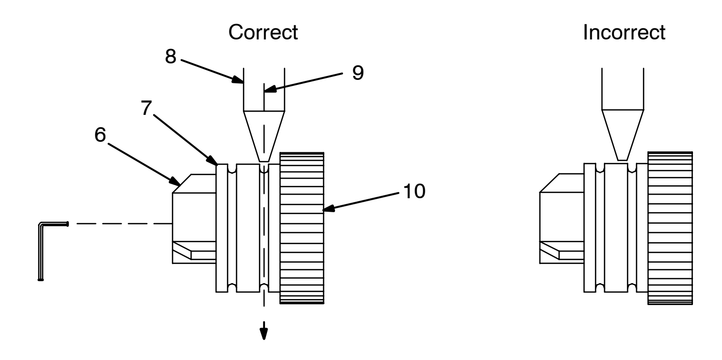
Close pressure roll assembly.

Only bottom drive roll alignment is adjustable. Turn adjustment screw in or out until groove in drive roll lines up with wire guide as shown.

Cleaning Drive Rolls:

Remove drive rolls, and clean grooves using a wire brush.

Aligning Wire Guide And Drive Rolls



Tools Needed:

3/16 in

Ref. 804 001-B

3-4. Connecting Welding Gun And Voltage Sensing Clamp

Internal Side View

▲ **Turn Off wire feeder and welding power source. Stop engine on welding generator.**

1 Gun Securing Knob
2 Gun Block
3 Gun Outlet Wire Guide

Loosen knob, insert gun end into block. Position outlet wire guide as close as possible to drive rolls without touching. Tighten knob.

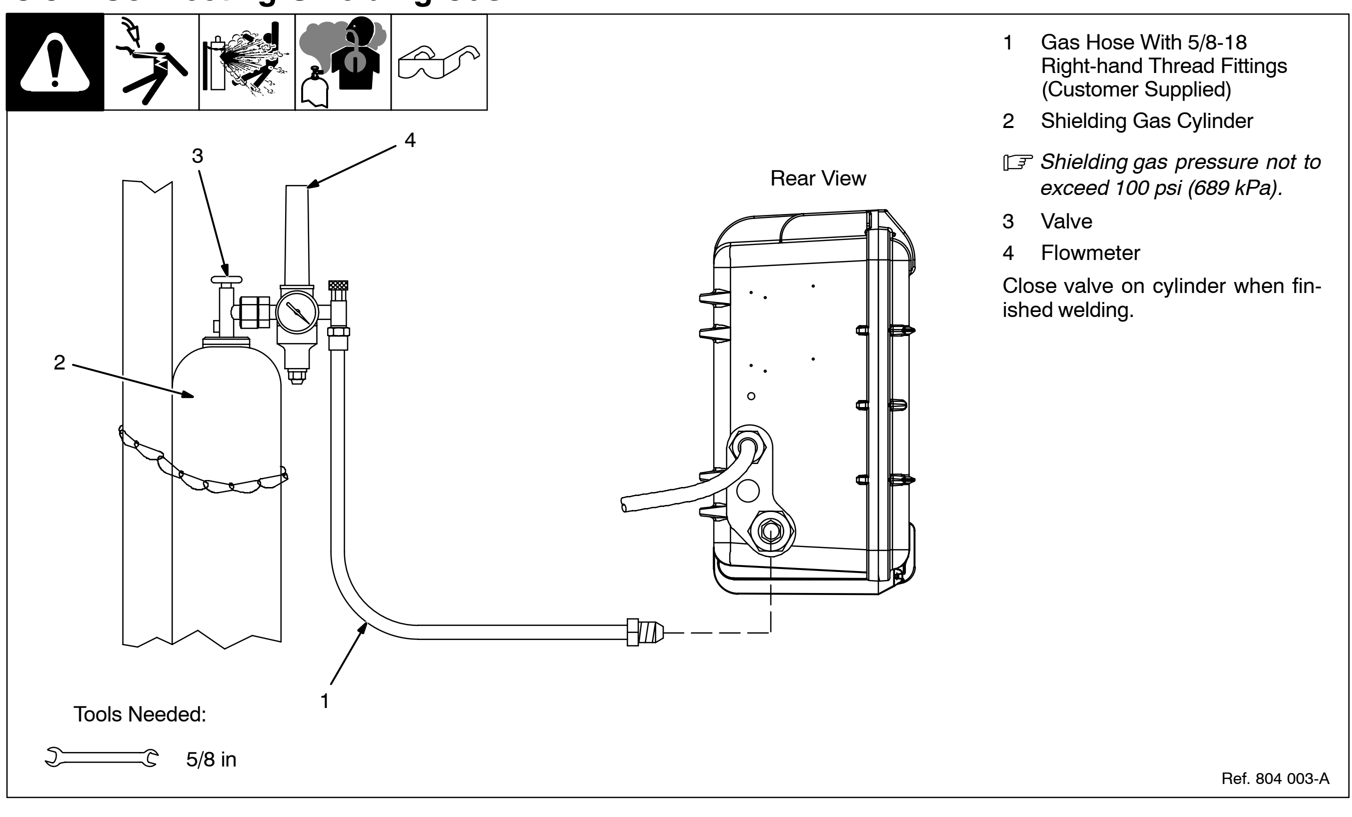
4 Gun Trigger Plug
5 Gun Trigger Receptacle
6 Voltage Sensing Clamp

Connect voltage sensing clamp to workpiece.

Ref. 804 002-C



3-5. Connecting Shielding Gas



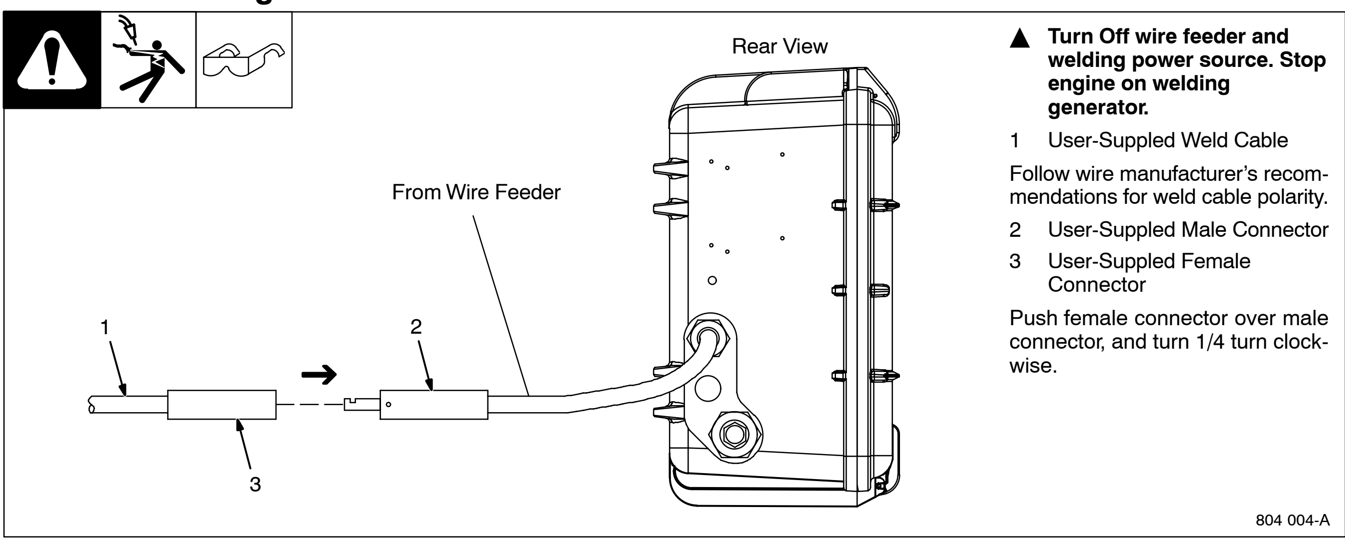
1 Gas Hose With 5/8-18 Right-hand Thread Fittings (Customer Supplied)
2 Shielding Gas Cylinder

☞ *Shielding gas pressure not to exceed 100 psi (689 kPa).*

3 Valve
4 Flowmeter

Close valve on cylinder when finished welding.

3-6. Connecting Weld Cable



▲ **Turn Off wire feeder and welding power source. Stop engine on welding generator.**

1 User-Supplied Weld Cable

Follow wire manufacturer's recommendations for weld cable polarity.

2 User-Suppled Male Connector

3 User-Suppled Female Connector

Push female connector over male connector, and turn 1/4 turn clockwise.

3-7. Weld Cable Sizes

Weld Output Terminals ▲ **Turn off power before connecting to weld output terminals.** ▲ **Do not use worn, damaged, undersized, or poorly spliced cables.**	**Welding Amperes**	**Weld Cable Size** and Total Cable (Copper) Length in Weld Circuit Not Exceeding*****							
		100 ft (30 m) or Less		**150 ft (45 m)**	**200 ft (60 m)**	**250 ft (70 m)**	**300 ft (90 m)**	**350 ft (105 m)**	**400 ft (120 m)**
		10 – 60% Duty Cycle	**60 – 100% Duty Cycle**	**10 – 100% Duty Cycle**					
	100	4 (20)	4 (20)	4 (20)	3 (30)	2 (35)	1 (50)	1/0 (60)	1/0 (60)
	150	3 (30)	3 (30)	2 (35)	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	3/0 (95)
	200	3 (30)	2 (35)	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	4/0 (120)
	250	2 (35)	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2 ea. 2/0 (2x70)	2 ea. 2/0 (2x70)
	300	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2 ea. 2/0 (2x70)	2 ea. 3/0 (2x95)	2 ea. 3/0 (2x95)
	350	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2 ea. 2/0 (2x70)	2 ea. 3/0 (2x95)	2 ea. 3/0 (2x95)	2 ea. 4/0 (2x120)
	400	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2 ea. 2/0 (2x70)	2 ea. 3/0 (2x95)	2 ea. 4/0 (2x120)	2 ea. 4/0 (2x120)
	500	2/0 (70)	3/0 (95)	4/0 (120)	2 ea. 2/0 (2x70)	2 ea. 3/0 (2x95)	2 ea. 4/0 (2x120)	3 ea. 3/0 (3x95)	3 ea. 3/0 (3x95)

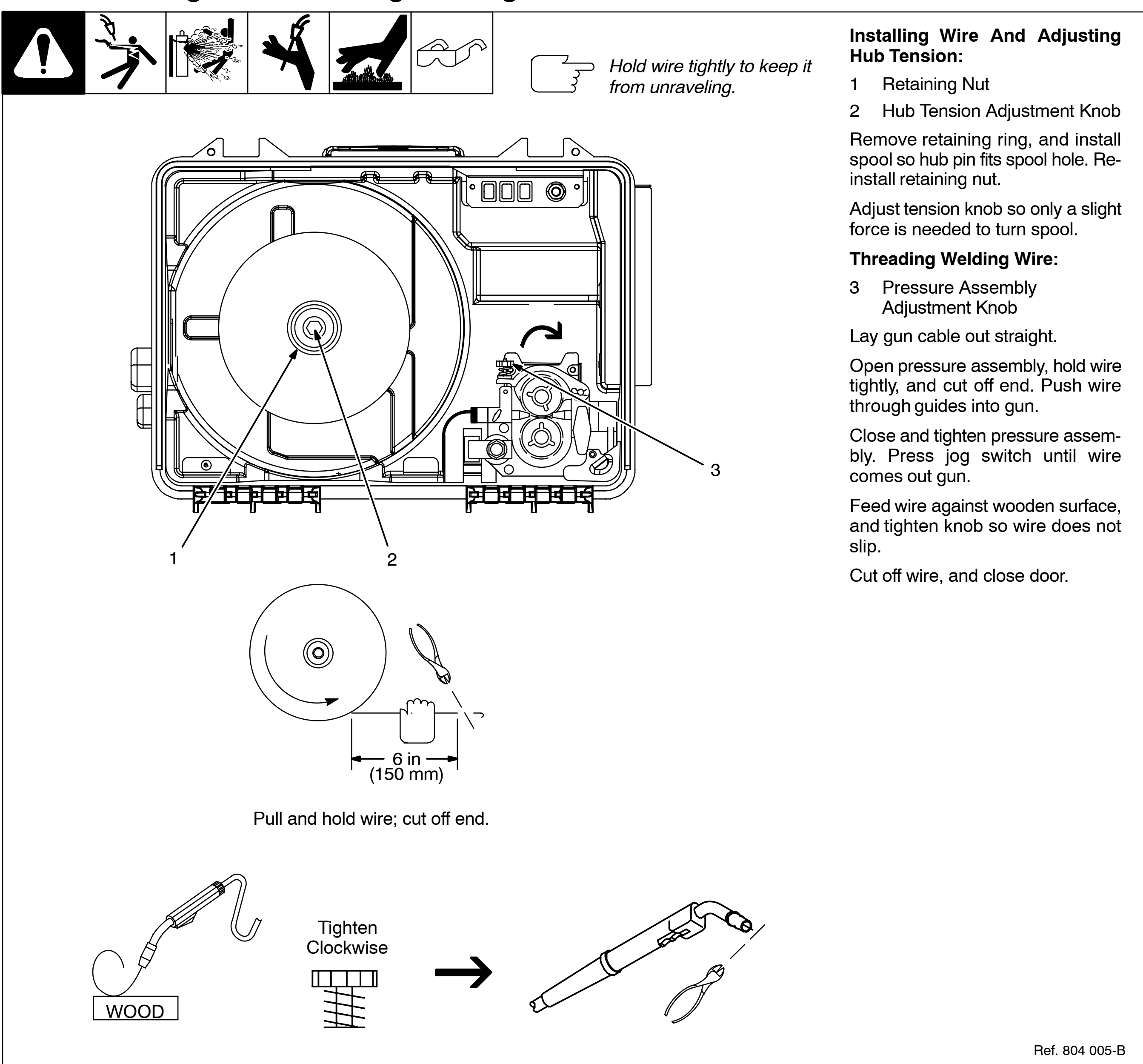
* This chart is a general guideline and may not suit all applications. If cable overheats, use next size larger cable.

**Weld cable size (AWG) is based on either a 4 volts or less drop or a current density of at least 300 circular mils per ampere.
( ) = mm^2 for metric use

S-0007-F–

***For distances longer than those shown in this guide, call a factory applications representative at 920-735-4505.

3-8. Installing And Threading Welding Wire



Installing Wire And Adjusting Hub Tension:

1 Retaining Nut

2 Hub Tension Adjustment Knob

Remove retaining ring, and install spool so hub pin fits spool hole. Reinstall retaining nut.

Adjust tension knob so only a slight force is needed to turn spool.

Threading Welding Wire:

3 Pressure Assembly Adjustment Knob

Lay gun cable out straight.

Open pressure assembly, hold wire tightly, and cut off end. Push wire through guides into gun.

Close and tighten pressure assembly. Press jog switch until wire comes out gun.

Feed wire against wooden surface, and tighten knob so wire does not slip.

Cut off wire, and close door.

Ref. 804 005-B

3-9. Display Board (PC20) DIP Switch Settings

DIP Switch Factory Settings

Indicates Switch does not Affect This Function

DIP switch is located behind front panel as shown.

Ref. 804 006-A

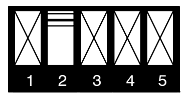
DIP Switch Settings:

Display Hold ON

Displays will hold their last value for five seconds after the trigger is released. After the hold times out, the Voltage Display will show open circuit voltage. If the Wire Speed / Amps Display is set to display Amps, the amperage value will hold, after the hold times out, preset Wire Speed will be displayed.

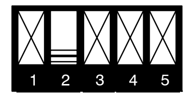
Display Hold OFF

Displays will not hold values. Immediately, when the trigger is released, the Voltage Display will show open circuit voltage. The Wire Speed / Amps Display will display preset Wire Speed when the trigger is released.



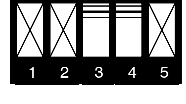
Do Not Display Amperage

Wire Speed / Amps Display will display only Wire Speed.



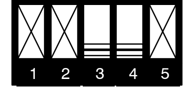
Display Amperage

Wire Speed / Amps Display will display Amps while welding and Wire Speed while not welding. If the hold function is enabled, Amps will be displayed during hold also.



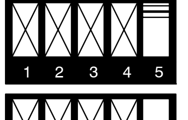
Wire Speed - Inches Per Minute

Displays Wire Speed in Inches per Minute.



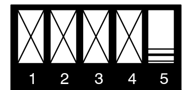
Wire Speed - Meters Per Minute

Displays Wire Speed in Meters per Minute.



Information OFF

Information is not displayed.



Information ON

With switch in ON position, at feeder power up, feeder will display various sets of information. Each set of information will be displayed for three seconds.

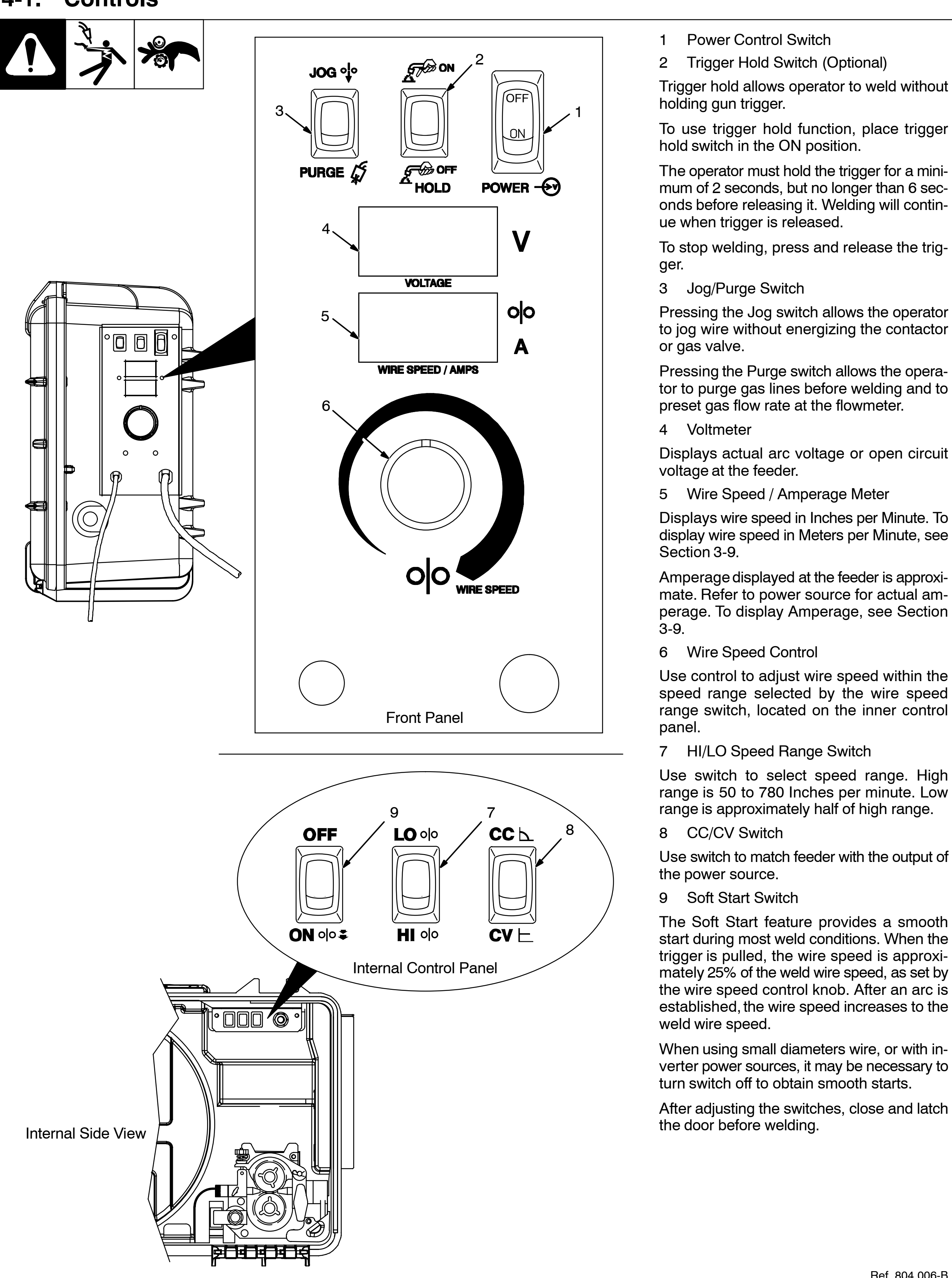
Display Board (PC20) Software Part Number –
Top display will show the first three digits, bottom display will show last three digits of the Display board (PC20) software revision level.

Motor Board (PC1) Software Part Number –
Top display will show the first three digits, bottom display will show last three digits, of the Motor board (PC1) software revision level.

Accumulated Weld Time –
This is the time the feeder has actually been used for welding. This information will be displayed in two halves. First being years and days, second in hours and minutes. Top display will show years/hours, bottom display will show days/minutes.

SECTION 4 – OPERATION

4-1. Controls



1 Power Control Switch

2 Trigger Hold Switch (Optional)

Trigger hold allows operator to weld without holding gun trigger.

To use trigger hold function, place trigger hold switch in the ON position.

The operator must hold the trigger for a minimum of 2 seconds, but no longer than 6 seconds before releasing it. Welding will continue when trigger is released.

To stop welding, press and release the trigger.

3 Jog/Purge Switch

Pressing the Jog switch allows the operator to jog wire without energizing the contactor or gas valve.

Pressing the Purge switch allows the operator to purge gas lines before welding and to preset gas flow rate at the flowmeter.

4 Voltmeter

Displays actual arc voltage or open circuit voltage at the feeder.

5 Wire Speed / Amperage Meter

Displays wire speed in Inches per Minute. To display wire speed in Meters per Minute, see Section 3-9.

Amperage displayed at the feeder is approximate. Refer to power source for actual amperage. To display Amperage, see Section 3-9.

6 Wire Speed Control

Use control to adjust wire speed within the speed range selected by the wire speed range switch, located on the inner control panel.

7 HI/LO Speed Range Switch

Use switch to select speed range. High range is 50 to 780 Inches per minute. Low range is approximately half of high range.

8 CC/CV Switch

Use switch to match feeder with the output of the power source.

9 Soft Start Switch

The Soft Start feature provides a smooth start during most weld conditions. When the trigger is pulled, the wire speed is approximately 25% of the weld wire speed, as set by the wire speed control knob. After an arc is established, the wire speed increases to the weld wire speed.

When using small diameters wire, or with inverter power sources, it may be necessary to turn switch off to obtain smooth starts.

After adjusting the switches, close and latch the door before welding.

Ref. 804 006-B

4-2. Wire Speed Control Settings

RECOMMENDED WELD PARAMETER TABLE

Use this table to set the wire speed setting at the feeder, and amperage or arc voltage settings at the welding power source.

Wire size: 0.030		Wire Type: ER70S-6			Gas Mix: 75/25								
Wire Speed	100	150	200	250	300	350	400	450	500	550	600	650	700	750
Voltage		17.0	17.1	17.9	18.9	19.3	20.0	20.7	21.2	24.6				
Amperage		65	83	97	116	125	139	153	152	160				

Wire size: 0.035		Wire Type: ER70S-6			Gas Mix: 75/25								
Wire Speed	100	150	200	250	300	350	400	450	500	550	600	650	700	750
Voltage		16.5	17.2	17.6	19.0	20.4	21.0	24.0	28.0	28.0				
Amperage		96	100	137	140	147	160	180	200	213				

Wire size: 0.045		Wire Type: ER70S-6			Gas Mix: 75/25								
Wire Speed	100	150	200	250	300	350	400	450	500	550	600	650	700	750
Voltage	16.5	17.2	17.5	20.5	22.3	23.5	28.5	31.2	32.3					
Amperage	100	158	168	198	207	232	255	278	306					

Wire size: 0.045		Wire Type: E71T-1M H-8			Gas Mix: 75/25								
Wire Speed	100	150	200	250	300	350	400	450	500	550	600	650	700	750
Voltage			19.7	20.5	22.5	24.0	27.2	28.0	28.4	29.5				
Amperage			131	155	170	207	218	236	264	284				

Wire size: 0.052		Wire Type: E71T-1M H-8			Gas Mix: 75/25								
Wire Speed	100	150	200	250	300	350	400	450	500	550	600	650	700	750
Voltage		18.0	18.5	23.0	24.7	26.0	29.7	32.0	33.2	35.5				
Amperage		140	160	190	225	240	271	300	328	340				

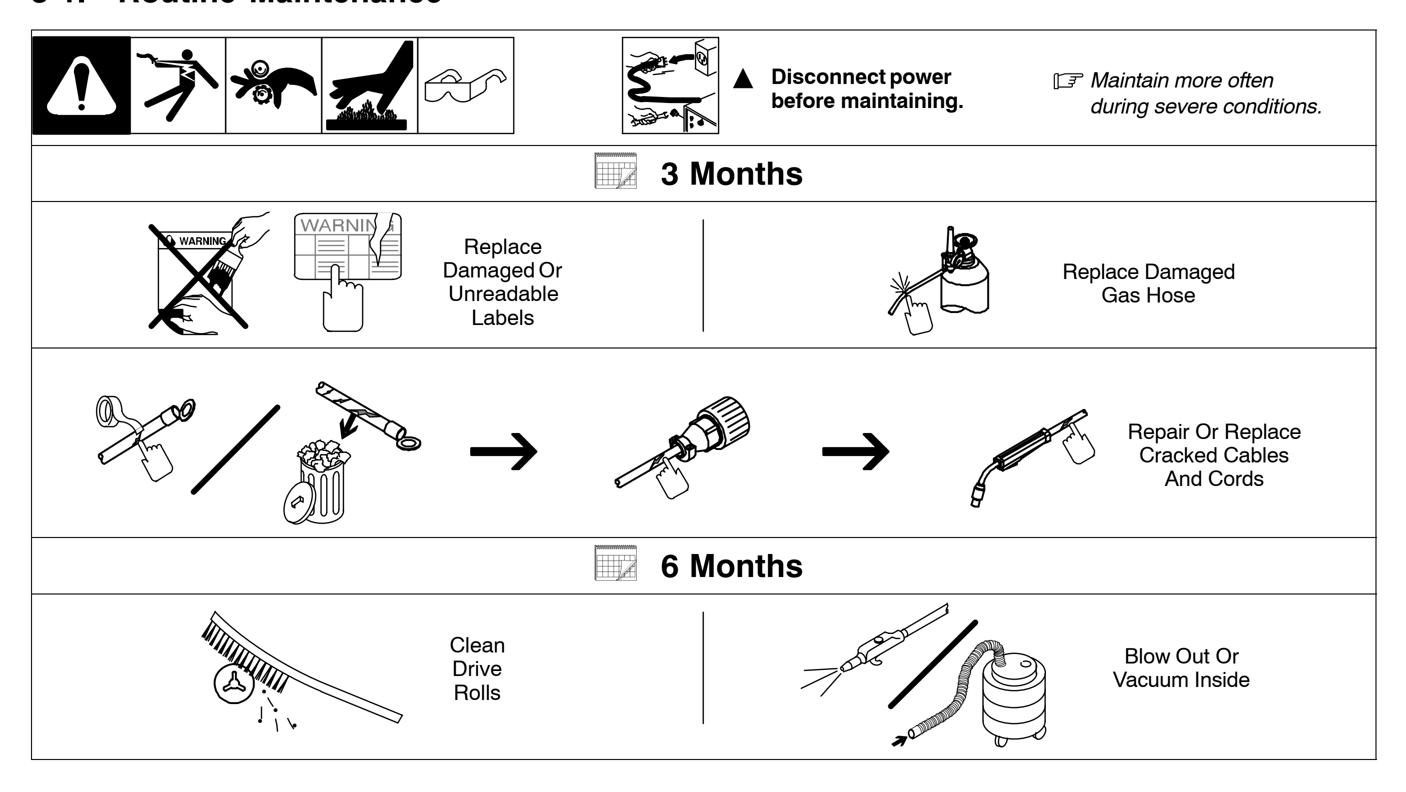
Wire size: 0.062		Wire Type: E71T-1M H-8			Gas Mix: 75/25								
Wire Speed	100	150	200	250	300	350	400	450	500	550	600	650	700	750
Voltage		18.5	20.0	23.3	24.0	27.2								
Amperage		170	202	228	270	302								

When welding in CC mode, adjust wire feed speed on feeder and amperage on power source, to get desired arc voltage.
When welding in CV mode, adjust wire feed speed on feeder and arc voltage on power source, to get desired weld amperage.
NOTE: CV is the recommended mode whenever possible.
Wire Speed is shown in inches per minute. Gas mix is 75% Argon and 25% CO_2.
Arc characteristics may vary due to cable length, size and type of wire used, and gas type.

Ref. 222 307-A

SECTION 5 – MAINTENANCE & TROUBLESHOOTING

5-1. Routine Maintenance



5-2. Overload Protection And Thermostat Protection

▲ Turn Off wire feeder and welding power source. Stop engine on welding generator.

1 Circuit Breaker CB1

CB1 protects wire feeder from overload. Correct problem and reset CB1.

Close and latch door.

Thermostat Protection

Unit has internal thermostat protection and will not feed wire if overheating occurs (see Section 5-3).

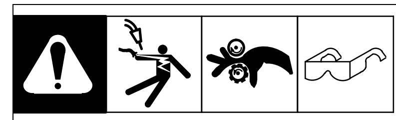
1

CB1

Internal Side View

Ref. 804 006-B

5-3. Troubleshooting



Trouble	Remedy
Wire does not feed; open-circuit voltage available.	Check circuit breaker CB1. Reset CB1.
	Unit overheated. Allow unit to cool.
	Check sensing lead connection.
	Check gun trigger plug connection.
	Check gun trigger. See gun Owner's Manual.
	Have Factory Authorized Service Agent check Control board PC1.
Wire feeds erratically.	Readjust hub tension.
	Readjust drive roll pressure.
	Clean or replace dirty or worn drive roll (see Section 3-3).
	Remove weld spatter around nozzle opening.
	Replace contact tip or liner. See gun Owner's Manual.
	Change to correct size and type drive roll (see Section 3-3)
	Incorrect size or worn wire guides (see Section 3-3)
	Check wire drive motor brushes.
	Have Factory Authorized Service Agent check control board PC1.
Motor runs slowly.	Check and replace contact tip or liner if necessary.
	Have Factory Authorized Service Agent check Control board PC1.
	If soft start is not on, motor will switch to slower speed if current is not sensed by HD1.
	When soft start is on, motor will run slow until weld current is sensed by HD1.
Unit does not switch out of Soft Start.	Check transducer HD1 and connections, and replace if necessary.
Wire feeds when Jog switch is pressed but not when gun trigger is pressed.	Check gun trigger connection at wire feeder. Check gun trigger leads and trigger switch. See gun Owner's Manual.
	Have Factory Authorized Service Agent check Control board PC1.
Wire stubbing on low end using a constant current power source or feeder resets.	Make sure CC/CV switch is in CC position (see Section 4-1).
	Increase power source inductance setting if available.
	Increase output setting of power source or decrease wire feed speed.
Gas does not flow or does not stop flowing; wire feeds.	Check gas valve.
	Check coil voltage and connections of gas valve GS1. Check continuity of coil. Replace GS1 if necessary.
	Have Factory Authorized Service Agent check Control board PC1.
	Clear blockage in gas hose or replace hose.
	Clear blockage in welding gun.
Wire remains energized after trigger is released.	Check contactor W1 to see if contacts are frozen closed.
Gun trigger is pressed, gas does not flow, wire is not energized, wire feeds.	If a welding arc is not established in 3 seconds, after the gun trigger is activated, the unit will feed wire without energizing the contactor or gas valve. If the gun trigger is still activated after two minutes, the wire will stop feeding. This is to prevent complete despoolling of the wire, as in the case of a damaged gun.

Trouble	Remedy
Information on display board is not accurate.	Have Factory Authorized Service Agent check Control board PC1.
	Check transducer HD1 and connections, and replace if necessary.
Display on display board does not light.	Have Factory Authorized Service Agent check Control board PC1.
	Replace display board.
Segments on the display board are missing.	Replace display board.

5-4. Diagnostics

Error Indicators		
Shown On Display	RED LED on Motor Board PC1	Error
HLP 11	1 Blink	Communication Error
HLP 14	4 Blinks (Constant Blinking)	Motor Overload Error
HLP 15	3 Blinks	Bus Bar Overheat Error

Error Indications

Error conditions are indicated by a “HLP” message on the display, or by the blinking of the Red LED on Motor Board PC1. To view the Red LED, turn Off power source, remove shroud, and turn power source On. The Red LED blinks in a 2.5 second cycle. The number of blinks in this period indicates the type of error. If an error condition does not exist on the motor board, the Red LED is on steady.

Communication Error

The communication error occurs 2.5 seconds after a loss of communication between the motor board and the meter board. The user may continue to weld with this error. The error may be cleared by turning power Off, waiting a minimum of two seconds, and turning power On.

Motor Overload Error

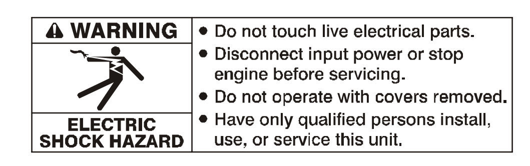
The motor overload error can indicate that the motor has been drawing too much current for too long, To remedy this, reduce the wire feed speed or the wire feeder torque load/duty cycle. The error may be cleared by turning power Off, waiting a minimum of two seconds, and turning power On.

Bus Bar Overheat Error

The bus bar overheat error can be caused by the arc drawing too much current for too long. To remedy this, reduce the weld amperage or duty cycle.

SECTION 6 – ELECTRICAL DIAGRAM

VOLT SENSE LEAD
CB1
TRIGGER RC2
WIRE DRIVE HOUSING
M1
TP2
W1
TP1
HD1
BUS BAR
GS1
WELD CABLE
C2
C1
COM
RC17-1
RC17-2
RC17-3
RC7-7
RC6-1
RC6-2
RC4-1
RC4-2
RC5-4
RC5-3
RC8-7
RC8-8
RC8-10
RC5-2
RC5-1
RC3-5
RC3-3
RC3-4
RC8-5
RC8-6
RC8-3
RC8-1
MOTOR BOARD
PC1
RC3/PLG3
RC4/PLG4
RC5/PLG5
RC6/PLG6
RC7/PLG7
RC8/PLG8
RC9/PLG9
RC10/PLG10
RC10-16
RC10-15
RC10-1
RC10-2
RC10-3
RC10-10
RC10-12
RC9-1
RC9-2
RC9-5
RC10-8
RC10-4
RC10-5
RC10-6
RC10-7
RC7-1
RC7-8
RC7-9
RC7-2
RC7-6
RC7-12
V SENSE
S1 OFF POWER ON
FRONT PANEL W/METER
+5V
WFS COMMAND
COM
+15V
TXD/RXD
RC22-2
RC22-1
RC22-3
RC22-7
RC22-8
RC21-1
RC21-2
RC21-5
METER BOARD
PC20
RC21/PLG21
RC22/PLG22
S2 JOG
JOG/PURGE
PURGE
S4 ON TRIGGER HOLD (OPT) OFF
S3 CV CC
S5 HIGH LOW
S6 SOFT START ON OFF



232 080-A

Figure 6-1. Circuit Diagram For Wire Feeder

Notes

MATERIAL THICKNESS REFERENCE CHART

24 Gauge (.025 in)
22 Gauge (.031 in)
20 Gauge (.037 in)
18 Gauge (.050 in)
16 Gauge (.063 in)
14 Gauge (.078 in)
1/8 in (.125 in)
3/16 in (.188 in)
1/4 in (.25 in)
5/16 in (.313 in)
3/8 in (.375 in)
1/2 in (.5 in)

SECTION 7 – PARTS LIST

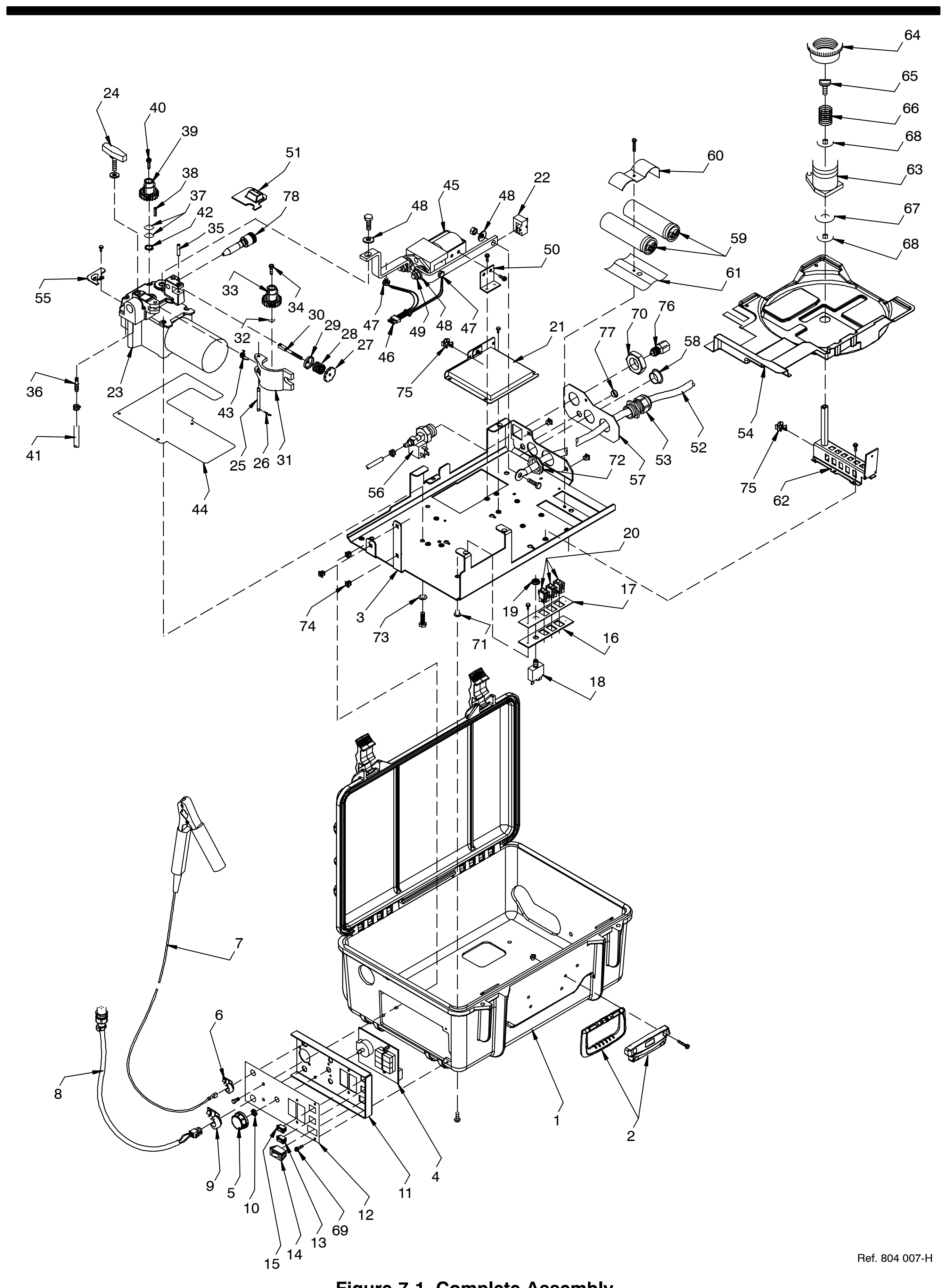


Figure 7-1. Complete Assembly

Item No.	Diagram marking	Part No.	Description	Quantity

Figure 7-1. Complete Assembly

Item No.	Diagram marking	Part No.	Description	Quantity
1		221 050	Case, Control Feeder Plastic	1
2		208 015	Handle, Rubberized Carrying	1
3		221 051	Chassis, Control Box	1
4	PC20	220 186	Circuit Card Assy, Meter Suitcase W/Program	1
5		179 851	Knob, Pointer 1.670 Dia X .250 Id Push On W/Spring	1
6		230 228	Bushing, Strain Relief .120/.150 Id X .500 Mtg Hole	1
7		214 011	Cable, Sensing	1
8		221 998	Cable, Trigger 25 In	1
9		230 227	Bushing, Strain Relief .300 Id X .550/.625 Mtg Hole	1
10		604 645	Nut, 375-32 .56Hex .09H Stl Cad Use W/Pots	1
11		220 442	Panel, Front	1
12		224 177	Nameplate, Red−D−Arc W/Meters	1
13		222 797	Blank, Snap−In Nyl Rect Mtg Hole Black	1
14	S1	111 997	Switch, Rocker Spst 10A 250VAC On-Off Visi Red Rock	1
15	S2	216 295	Switch, Rocker Spdt .4VA 28VDC (On)-Off-(On) .187T	1
16		208 076	Panel, Inner	1
17		216 315	Nameplate, Inner	1
18	CB1	083 432	Circuit Breaker, Man Reset 1P 10A 250VAC Frict	1
19		147 195	Nut, 375-27 .54Hex .25h Nyl Flange .62D	1
20	S3, S5, S6	217 932	Switch, Rocker Spst .4VA 28VDC On-None-Off .187 Ter	3
21	PC1	224 675	Circuit Card Assy, Motor Control W/Program	1
22	HD1	218 339	Transducer, Current 600A Module Supply V +5V	1
23	M1	220 195	Motor, Right Angle 24VDC 145 RPM 37.5 Ratio W/Plug	1
24		124 778	Knob, T 2.000 Bar W/.312-18 Stud 1.000 Lg Plstc	1
25		079 634	Pin, Hinge	1
26		151 828	Pin, Cotter Hair .042 X .750	2
27		085 243	Knob, Adjust Tension 1.250 Dia X .312−18 Thrd Stl	1
28		089 477	Spring, Cprsn .770 Od X .100 Wire X .715 Pld	1
29		085 244	Washer, Cupped .328idx .812odx16gax.125 Lip	1
30		089 562	Fastener, Pinned	1
31		166 071	Lever, Mtg Pressure Gear	1
32		166 072	Spacer, Gear	1
33		172 075	Carrier, Drive Roll W/Components 24 Pitch	1
34		602 009	Screw, 250−20x1.25 Soc Hd−Hex Gr8 Pln	1
35		010 224	Pin, Spring Cs .187 X 1.000	1
36		144 172	Ftg, Hose Brs Barbed M 3/16 Tbg X .250-20	1
37		079 625	Washer, Wave .500idx0.750odx.015T Stl Lbs	2
38		092 865	Key, Stl .1215/.1230 X .750	1
39		172 076	Carrier, Drive Roll W/Components Keyed 24 Pitch	1
40		121 271	Screw, 250-20x .50 Soc Hd-Hex Gr8 Pln Lkg Patch	1
41		098 615	Hose, Sae .187 Id X .410 Od X 20.000	1
42		605 308	Ring, Rtng Ext .500 Shaft X .035 Thk	1
43		222 159	Spring, Torsion	1
44		222 396	Insulator, Motor	1
45	W1	224 697	Contactor 12VDC W/Bus Bars, (Includes)	1
46	PLG5	201 665	Housing Plug+Skts, (Service Kit)	1
47	TP1, TP2	220 221	Thermostat, Nc Open 140C Close 110C Snap Action	2
48		183 387	Washer, Cone .380idx .860odx.109t Stl Pld 4000Lbs	4
49		223 862	Nut, M10-1.5 17Hex 8H Brs Din 934	2
50		222 001	Bracket, Mtg Contactor	1
51		221 347	Grommet, Bus Bar	1
52		600 324	Cable, Weld Cop Strd No 4/0 Epdm Jkt	18 in
53		215 980	Bushing, Strain Relief .709/.984 Id X1.375 Mtg Hole	1
54		221 052	Shroud, Wire	1
55		207 679	Insert, Corner	1

Item No.	Diagram marking	Part No.	Description	Quantity

Figure 7-1. Complete Assembly (Continued)

Item No.	Diagram marking	Part No.	Description	Quantity
56	GS1	215 284	Valve, 12VDC 1Way .750-14 Thd 1/8 Orf 100PSI	1
57		222 067	Insulator, Rear Panel	1
58		070 371	Blank, Snap-In Nyl 1.093/1.125 Mtg Hole Black	1
59	C1, C2	200 606	Capacitor, Elctlt 1200 Uf 300 VDC Can 1.39 Dia	2
60		210 133	Bracket, Capacitor Support SC12	1
61		207 678	Insulator, Capacitors	1
62		222 103	Support, Spool	1
63		225 069	Hub, Spool W/Threads	1
64		209 450	Nut, Hub	1
65		172 919	Knob, Brake Adjust	1
66		172 918	Spring	1
67		058 424	Washer, Fibre (Brake)	1
68		201 309	Washer, Anti-Turn	2
		223 814	Label, Warn Gen Precaution Suitcase	1
		196 956	Label, Warning Electric Shock And Pinch Wordless	1
		222 306	Label, Warning General Precautionary Static Vert	2
69		145 217	Screw, K40x 12 Pan Hd-Phl Stl Pld Pt Thread Forming	2
70		220 805	Nut, 750-14 Knurled 1.68Dia .41H Nyl	1
71		081 895	Nut, 010-32 Rubber .75Dia .81l Insert In .38Hole	5
72		182 445	Nut, Conduit 1.000 Npt Pld 1.688 Od X .200 Thk	1
73		208 000	Washer, Shldr .260id 0.630odx.125t .327odx.062t Nyl	4
74		222 181	Grommet, Scr No 8/10 Panel Hole .281 Sq .031 High	5
75		222 294	Clip, Wire/Cord .380 Bundle .250Hole .105 Thk Blk	2
76		211 989	Fitting, W/Screen	1
77		107 983	Blank, Snap−In Nyl .500 Mtg Hole Black	1
78		221 030	Guide, Wire Inlet Anti-Wear One Pc (.023 To 5/64)	1
	PLG10	131 052	Housing Rcpt+Skts, (Service Kit)	1
	PLG22	115 092	Housing Plug+Skts, (Service Kit)	1
	PLG7	130 203	Housing Plug+Skts, (Service Kit)	1
	PLG8	115 092	Housing Plug+Skts, (Service Kit)	1
	PLG5	201 665	Housing Plug+Skts, (Service Kit)	1
	PLG3	130 203	Housing Plug+Skts, (Service Kit)	1
	PLG4	131 054	Housing Rcpt+Skts, (Service Kit)	1
	PLG6	115 094	Housing Plug+Skts, (Service Kit)	1
	PLG9, 21	131 055	Housing Rcpt+Skts, (Service Kit)	2
	PLG17	222 397	Housing Plug+Skts, (Service Kit)	1
	RC2	080 328	Rcpt W/Skts, Free Hanging	1

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Table 7-1. Drive Roll & Wire Guide Kits (2 Drive Roll)

NOTE

Base selection of drive rolls upon the following recommended usages:
1. *V-Grooved rolls for hard wire.*
2. *U-Grooved rolls for soft and soft shelled cored wires.*
3. *U-Cogged rolls for extremely soft shelled wires (usually hard surfacing types).*
4. *V-Knurled rolls for hard shelled cored wires.*
5. *Drive roll types may be mixed to suit particular requirements (example: V-Knurled roll in combination with U-Grooved).*

Wire Diameter			Kit No.	Drive Roll		Inlet Wire Guide
Fraction	Decimal	Metric		Part No.	Type	
.023/.025 in	.023/.025 in	0.6 mm	087 131	087 130	V-Grooved	056 192
.030 in	.030 in	0.8 mm	079 594	053 695	V-Grooved	056 192
.035 in	.035 in	0.9 mm	079 595	053 700	V-Grooved	056 192
.040 in	.040 in	1.0 mm	161 189	053 696	V-Grooved	056 192
.045 in	.045 in	1.2 mm	079 596	053 697	V-Grooved	056 193
.052 in	.052 in	1.3 mm	079 597	053 698	V-Grooved	056 193
1/16 in	.062 in	1.6 mm	079 598	053 699	V-Grooved	056 195
.035 in	.035 in	0.9 mm	044 749	072 000	U-Grooved	056 192
.045 in	.045 in	1.2 mm	079 599	053 701	U-Grooved	056 193
.052 in	.052 in	1.3 mm	079 600	053 702	U-Grooved	056 193
1/16 in	.062 in	1.6 mm	079 601	053 706	U-Grooved	056 195
5/64 in	.079 in	2.0 mm	079 602	053 704	U-Grooved	056 195
.035 in	.035 in	0.9 mm	079 606	132 958	V-Knurled	056 192
.045 in	.045 in	1.2 mm	079 607	132 957	V-Knurled	056 193
.052 in	.052 in	1.3 mm	079 608	132 956	V-Knurled	056 193
1/16 in	.062 in	1.6 mm	079 609	132 955	V-Knurled	056 195
.068-.072 in	.068-.072	1.8 mm	089 984	132 959	V-Knurled	056 195
5/64 in	.079 in	2.0 mm	079 610	132 960	V-Knurled	056 195
.045 in	.045 in	1.2 mm	083 318	083 489	U-Cogged	056 193
.052 in	.052 in	1.3 mm	083 317	083 490	U-Cogged	056 193
1/16 in	.062 in	1.6 mm	079 614	053 708	U-Cogged	056 195
5/64 in	.079 in	2.0 mm	079 615	053 710	U-Cogged	056 195

S-0859

Notes

Work like a Pro!

Pros weld and cut safely. Read the safety rules at the beginning of this manual.

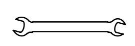
Notes

24 GA. (.0239)
22 GA. (.0299)
20 GA. (.0359)
18 GA. (.0478)
16 GA. (.0598)
14 GA. (.0747)
1/8" (.125)
10 GA. (.1345)
3/16" (.1875)
1/4" (.250)
5/16" (.3125)
.024"
.030"
.035"
229895

MATERIAL THICKNESS GAUGE

Notes

SOCKET/WRENCH SELECTION TABLE (U.S. STANDARD)



Specifications		Socket or Wrench Size	
Bolt Diameter	Decimal Equivalent	Bolt	Nut
1/4 in	.250 in	3/8 in	7/16 in
5/16 in	.3125 in	1/2 in	9/16 in
3/8 in	.375 in	9/16 in	5/8 in
7/16 in	.4375 in	5/8 in	3/4 in
1/2 in	.500 in	3/4 in	13/16 in
9/16 in	.5625 in	7/8 in	7/8 in
5/8 in	.625 in	15/16 in	1 in
3/4 in	.750 in	1-1/8 in	1-1/8 in
7/8 in	.875 in	1-5/16 in	1-5/16 in
1 in	1.000 in	1-1/2 in	1-1/2 in

SOCKET/WRENCH SELECTION TABLE (METRIC)

Specifications		Socket or Wrench Size	
Bolt Diameter	U.S. Decimal Equivalent	Bolt	Nut
6 mm	.2362 in	10 mm	10 mm
8 mm	.3150 in	14 mm	14 mm
10 mm	.3937 in	17 mm	17 mm
12 mm	.4724 in	19 mm	19 mm
14 mm	.5512 in	22 mm	22 mm
16 mm	.6299 in	24 mm	24 mm
18 mm	.7087 in	27 mm	27 mm
22 mm	.8661 in	32 mm	32 mm
24 mm	.9449 in	36 mm	36 mm

Warranty

Effective January 1, 2006
(Equipment with a serial number preface of “LG” or newer)

This limited warranty supersedes all previous manufacturers warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY − Subject to the terms and conditions below, warrants to its original retail purchaser that new equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped from factory. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, manufacturer will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Manufacturer must be notified in writing within thirty (30) days of such defect or failure, at which time manufacturer will provide instructions on the warranty claim procedures to be followed.

Manufacturer shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the date that the equipment was delivered to the original retail purchaser, or one year after the equipment is sent to the distributor.

1. 5 Years Parts — 3 Years Labor
   * Original main power rectifiers
2. 3 Years — Parts and Labor
   * Transformer/Rectifier Power Sources
   * Plasma Arc Cutting Power Sources
   * Process Controllers
   * Semi-Automatic and Automatic Wire Feeders
   * Inverter Power Sources (Unless Otherwise Stated)
   * Water Coolant Systems (Integrated)
   * Engine Driven Welding Generators
     (NOTE: Engines are warranted separately by the engine manufacturer.)
3. 1 Year — Parts and Labor Unless Specified
   * Motor Driven Guns (w/exception of Spoolmate Spoolguns)
   * Positioners and Controllers
   * Automatic Motion Devices
   * RFCS Foot Controls
   * Induction Heating Power Sources, Coolers, and Electronic Controls/Recorders
   * Water Coolant Systems (Non-Integrated)
   * Flowgauge and Flowmeter Regulators (No Labor)
   * HF Units
   * Grids
   * Spot Welders
   * Load Banks
   * Arc Stud Power Sources & Arc Stud Guns
   * Racks
   * Running Gear/Trailers
   * Plasma Cutting Torches (except APT & SAF models)
   * Field Options
     (NOTE: Field options are covered for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
   * Bernard-Branded Mig Guns (No Labor)
   * Weldcraft-Branded TIG Torches (No Labor)
   * Subarc Wire Drive Assemblies
4. 6 Months — Batteries
5. 90 Days — Parts and Labor
   * MIG Guns/TIG Torches and Subarc (SAW) Guns
   * Induction Heating Coils and Blankets, Cables, and Non-Electronic Controls
   * APT & SAF Plasma Cutting Torches
   * Remote Controls
   * Accessory Kits
   * Replacement Parts (No Labor)
   * Spoolmate Spoolguns
   * Canvas Covers

Limited Warranty shall not apply to:

1. **Consumable components; such as contact tips, cutting nozzles, contactors, relays, brushes, slip rings, or parts that fail due to normal wear.**
2. Items furnished by manufacturer, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer’s warranty, if any.
3. Equipment that has been modified by any party other than manufacturer, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

MANUFACTURER’S PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY COMMERCIAL/INDUSTRIAL USERS AND PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at manufacturer’s option: (1) repair; or (2) replacement; or, where authorized in writing by manufacturer in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer’s risk and expense. Manufacturer’s option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at an authorized service facility as determined by manufacturer. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL MANUFACTURER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT TORT OR ANY OTHER LEGAL THEORY WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MANUFACTURER IS EXCLUDED AND DISCLAIMED BY MANUFACTURER.

Some states in the U.S.A. do not allow limitations of how long an implied warranty lasts, or the exclusion of incidental, indirect, special or consequential damages, so the above limitation or exclusion may not apply to you. This warranty provides specific legal rights, and other rights may be available, but may vary from state to state.

In Canada, legislation in some provinces provides for certain additional warranties or remedies other than as stated herein, and to the extent that they may not be waived, the limitations and exclusions set out above may not apply. This Limited Warranty provides specific legal rights, and other rights may be available, but may vary from province to province.



Owner's Record

Please complete and retain with your personal records.

Model Name Serial/Style Number

Purchase Date (Date which equipment was delivered to original customer.)

Distributor

Address

City

State Zip



www.red-d-arc.com

Contact the Delivering Carrier to: File a claim for loss or damage during shipment.

For assistance in filing or settling claims, contact your distributor and/or equipment manufacturer's Transportation Department.

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